International Survey to assess current practice, opinon and attitudes of nephrologists regarding the defintion, diagnosis and classification of chronic kidney disease

Developed and evaluated by the KDIGO CKD Evaluation and Classification working group in 2004: K.-U. Eckardt, R. Walker (co-chairs), R. Burgos-Calderon, G. Eknoyan, A. Levin, J. Rossert, Y. Tsukamoto

There is uniform agreement among members of the Executive Committee and Board of Directors of KDIGO that a common and simple definition and classification of kidney disease is necessary in order to achieve the goals of KDIGO on an international level.

As a preparatory step for a Controversies Conference on this topic, which was held in Amsterdam in November 2004, a survey was developed and disseminated by e-mail to 10,000 nephrologists worldwide to assess their current practice and opinions regarding the definition and classification of CKD and to learn about their experiences in using the definition and classification system developed by KDOQI in 2002.

The survey was web-based and was offered in five different languages (English, French, Spanish, Japanese, German). Several National and International Societies, including the ISN, the ERA-EDTA, the Spanish, the Latin-American and the French Society of Nephrology kindly supported this initiative by providing e-mail addresses of their members.

The results of this survey and many comments provided by the respondents were extremely valuable to the participants of the Controversies Conference and greatly helped to identify issues and areas of agreement, concern and uncertainty. On the other hand we have reasons to believe that, partly due to the consensus reached at the conference, in certain countries (e.g. in Japan) the attitude and opinion of physicians has changed already since the responses to the questionnaire were submitted.

Questions – more specifically

- What is the current practice (eGFR, measurement of proteinuria, definition of CKD, use of a classification system) ?
- Is there agreement on the use of eGFR as a basis of different stages of CKD ?
- Is there agreement on the use of spot urine samples ?
- What is the current knowledge on parameters required for eGFR ?
- What are potential barriers and concerns re the implementation ?

Methodology

- Questionnaire drafted by work-group members, reviewed and amended by KDIGO Board of Directors and other experts
- Preliminary “pilot“ version tested
- Approx. 10,000 nephrologists worldwide asked to complete final web-based version with 25 questions (English, French, Spanish, Japanese, German)
- E-mail addresses kindly provided by ISN, ERA-EDTA, Spanish Society of Nephrology, Latin American Society of Nephrology, French Society of Nephrology

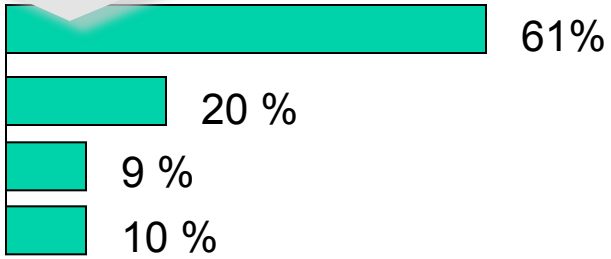
Response rate

	Responses	
Total	1190 (12 %)	
North America	255	21 %
Central / South America	83	7 %
Western Europe	265	31 %
Eastern Europe	107	9 %
Middle East	62	5 %
Africa	37	3 %
Asia – no Japan	78	7 %
Japan	141	12 %
Australia / New Zealand	23	2 %

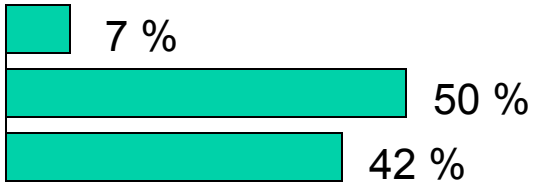
I. "Some information about you and where you practice nephrology"

> 70% in North America, Eastern Europe, Australia, New Zealand and Middle East

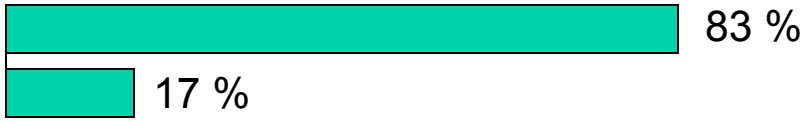
1. ***Where do you practice nephrology ?***
   - university or teaching hospital
   - nephrology unit in another hospital
   - dialysis centre
   - private practice



2. ***Age***
   - < 35 yrs
   - 35-50 yrs
   - > 50 yrs



3. ***Gender***
   - male
   - female



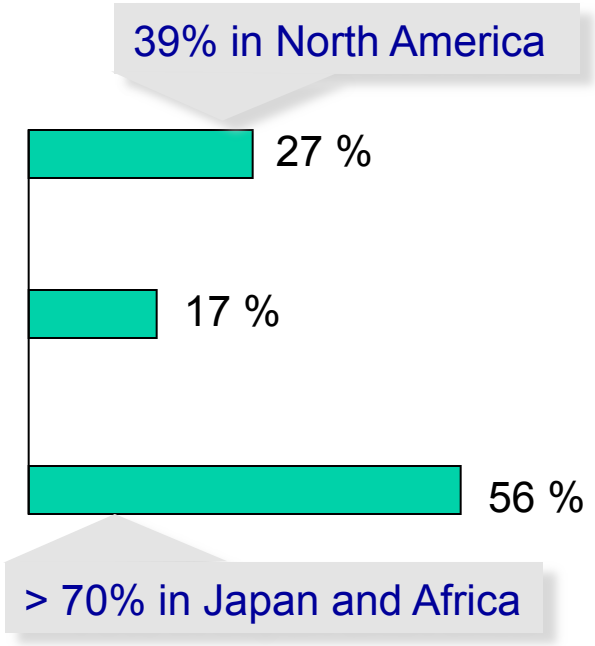
4. ***Country***

→ *selection bias (member of large societies, e-mail, senior staff, academic affiliations)*

II. "Your general view and current practice"

5. In current practice in my professional environment the definition of chronic kidney disease

- is well standardized and does *not* need to be improved
- is *not* well standardized, but efforts to improve it will *not* have a big impact on patient care and outcomes
- is *not* well standardized and improving it is likely to have a positive impact on patient care and outcomes



→ *44% : no need for change !*

II. "Your general view and current practice"

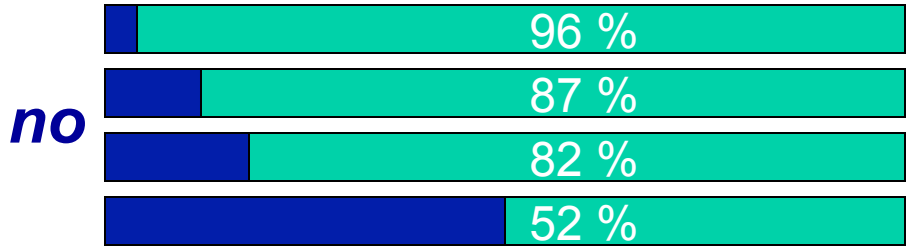
6. *In my opinion a general definition of chronic kidney disease should be based on*

- estimate of GFR **11** %
- documentation of proteinuria **8** %
- aetiology **2** %
- estimate of GFR *and* documentation of proteinuria **16** %
- estimate of GFR *and* aetiology **10** %
- estimate of GFR *and* documentation of proteinuria *and* aetiology **59** %

> 70% in Japan and Africa

7. *In my view a uniform classification system for chronic kidney disease should describe*

- disease severity
- prognosis for progression
- aetiology
- cardiovascular prognosis



→ *majority votes for complexity ? !*

II. "Your general view and current practice"

8. For the assessment of GFR I currently use…

	…in all patients	…in more than 50%	…in less than 50%	…in no patients
serum creatinine only				
estimated GFR from serum creatinine				
measured creatinine clearance				
other clearance technique				

II. "Your general view and current practice"

8. *For the assessment of GFR I currently use…*

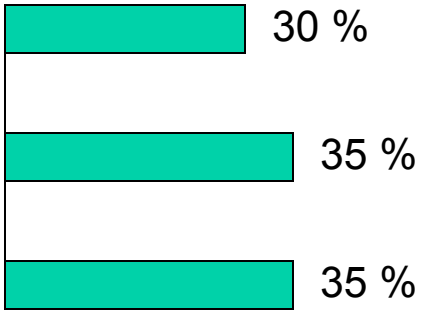
	…in all patients	…in more than 50%	…in less than 50%	…in no patients
serum creatinine only	most "popular" in North America least "popular" in Japan		24 %	27 %
estimated GFR from serum creatinine	40 %	30 %	24 %	6 %
measured creatinine clearance	16 %	28 %	44 %	13 %
other clearance technique	2 %	5 %	32 %	61 %

→ *eGFR far more frequently used than Crea Clearance!*

II. “Your general view and current practice“

9. Serum creatinine levels that I order in my practice are measured by

- the Jaffe-reaction
- an enzymatic method
- I do not know



→ *variability and uncertainty*

II. "Your general view and current practice"

10. For the assessment of proteinuria I currently use…

	… in all patients	… in more than 50%	… in less than 50%	… in no patients
dip sticks				
dip sticks to detect microalbuminuria				
quantitative albumin assay				
quantitative total protein assay				
spot samples				
timed collections (e.g. 24 hour)				
albumin or prot. concentrations related to urinary creatinine				

II. "Your general view and current practice"

10. *For the assessment of proteinuria I currently use…*

	… in all patients	… in more than 50%	… in less than 50%	… in no patients
dip sticks	59 %	11 %	16 %	14 %
dip sticks to detect microalbum…				
quantitative albumin assay	13 %	19 %	43 %	26 %
quantitativ… protein ass…				
spot samples	23 %	23 %	31 %	23 %
timed collections (e.g. 24 hour)	27 %	32 %	36 %	5 %
albumin or prot. concentrations related to urinary creatinine	22 %	26 %	32 %	20 %

above average in W Europe (except UK), Africa and Middle East

more "popular" in Japan, where only 9% never used them as compared to > 40 % who never used them in other regions

II. "Your general view and current practice"

10. For the assessment of proteinuria I currently use…

	… in all patients	… in more than 50%	… in less than 50%	… in no patients
dip sticks	59 %	11 %	16 %	14 %
dip sticks to detect microalbuminuria	6 %	9 %	34 %	51 %
quantitative albumin assay	13 %	19 %	43 %	26 %
quantitative total protein assay	33 %	32 %	24 %	11 %
spot samples				
tin (e.				
albumin or prot. concentrations related to urinary creatinine	22 %	26 %	32 %	20 %

→ *neither dipsticks to detect microalbuminuria nor quantitative albumin assays are frequently used; attention to microalbuminuria ?*

II. "Your general view and current practice"

10. For the assessment of proteinuria I currently use…

	… in all patients	… in more than 50%	… in less than 50%	… in no patients
dip sticks	59 %	11 %	16 %	14 %
dip sticks to detect microalbuminuria	6 %	9 %	34 %	51 %
protein assay	33 %	32 %	24 %	11 %
spot samples	23 %	23 %	31 %	23 %
timed collections (e.g. 24 hour)	27 %	32 %	36 %	5 %
albumin or prot. concentrations related to urinary creatinine	22 %	26 %	32 %	20 %

→*more than 20% of nephrologists never use spot-samples, whereas only 5% never use timed collections*

II. "Your general view and current practice"

11. In order to describe the status of patients with long standing reduction of GFR of less than 60 ml/min/1.73 m^2 , but not on dialysis, I use the following terms

	…in all patients	… in more than 50%	… in less than 50%	… no patients
chronic renal failure				
predialysis				
chronic renal insufficiency / impairment				
chronic kidney disease				

II. "Your general view and current practice"

11. In order to describe the status of patients with long standing reduction of GFR of less than 60 ml/min/1.73 m^2 , but not on dialysis, I use the following terms

	…in all patients	… in more than 50%	… in less than 50%	… no patients
chronic renal failure	23 %	20 %	22 %	35 %
predialysis	7 %	6 %	37 %	50 %
chronic renal insufficiency / impairment	31 %	22 %	20 %	20 %
chronic kidney disease	35 %	16 %	19 %	24 %

→ *not very clear tendencies*

II. “Your general view and current practice“

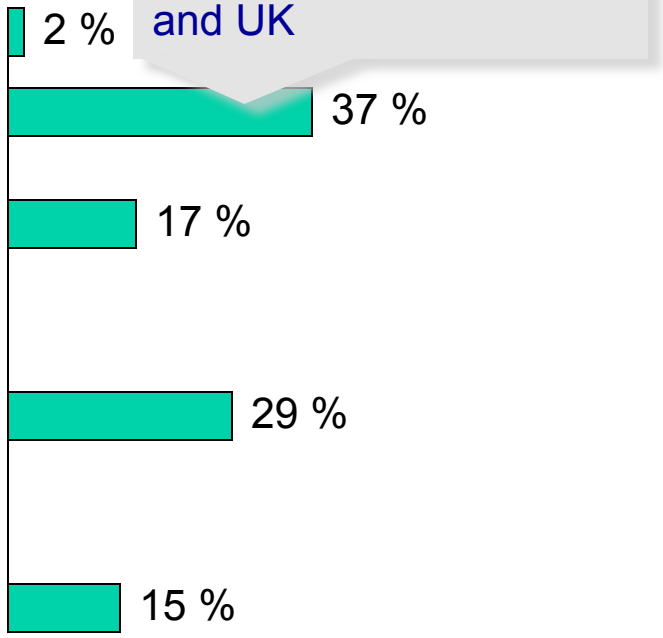
11a. Do you see a difference in these terms for medical communication, patient education or public awareness

→ *we do not speak a common language*

III. "Your recommendations"

12. In my opinion for the <u>detection of kidney disease</u> assessment of GFR should be based on

- serum creatinine in all patients
- eGFR in all patients
- serum creatinine in all patients and eGFR in selected cases
- serum creatinine in all patients and GFR (using creatinine clearance or other techniques) in selected cases
- measurement of GFR (using creatinine clearance or other techniques) in all patients

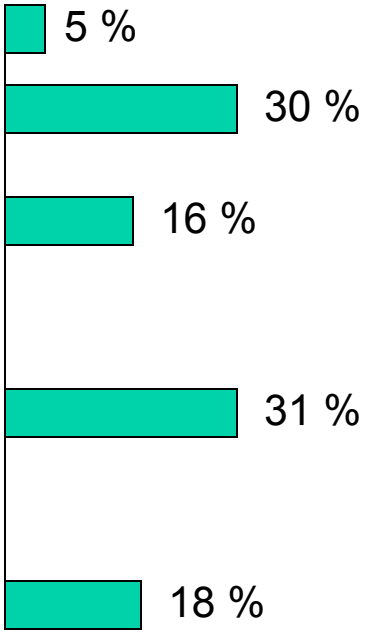


→ *more than 50% use eGFRs, but 30% prefer a combination of serum-creatinine and clearance measurements*

III. "Your recommendations"

13. In my opinion <u>monitoring the loss of kidney function</u> in patients with chronic kidney disease should be based on

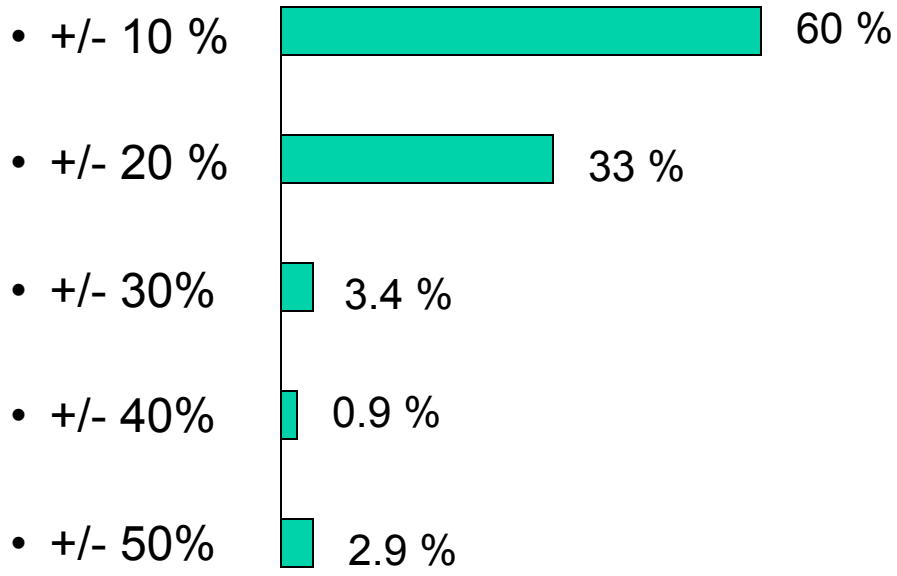
- serum creatinine in all patients
- eGFR in all patients
- serum creatinine in all patients and eGFR in selected cases
- serum creatinine in all patients and GFR (using creatinine clearance or other techniques) in selected cases
- measurement of GFR (using creatinine clearance or other techniques) in all patients



→ *not much difference between detection and monitoring*

IV. "Comment on different aspects of estimated GFR "

14. To what level of accuracy should GFR be estimated from equations in clinical practice ?



Highest	***Lowest***
expectations	
76%	53%
16%	43%
Africa	**Japan**

IV. "Comment on different aspects of estimated GFR "

15. For the two different form creatinine the following pa

$\frac{(140 - age) \times bw}{S\text{-}crea \times 72}$ **x 0.85 for female**	$186 \times S\text{-}crea^{-1.154} \times age^{-0.203}$ x 0.19 if African-American x 0.74 if female

	Cockcroft-Gault formula	abbreviated MDRD formula
serum creatinine	X	X
serum urea		
age	X	X
sex	X	X
body weight	X	
ethnicity		X

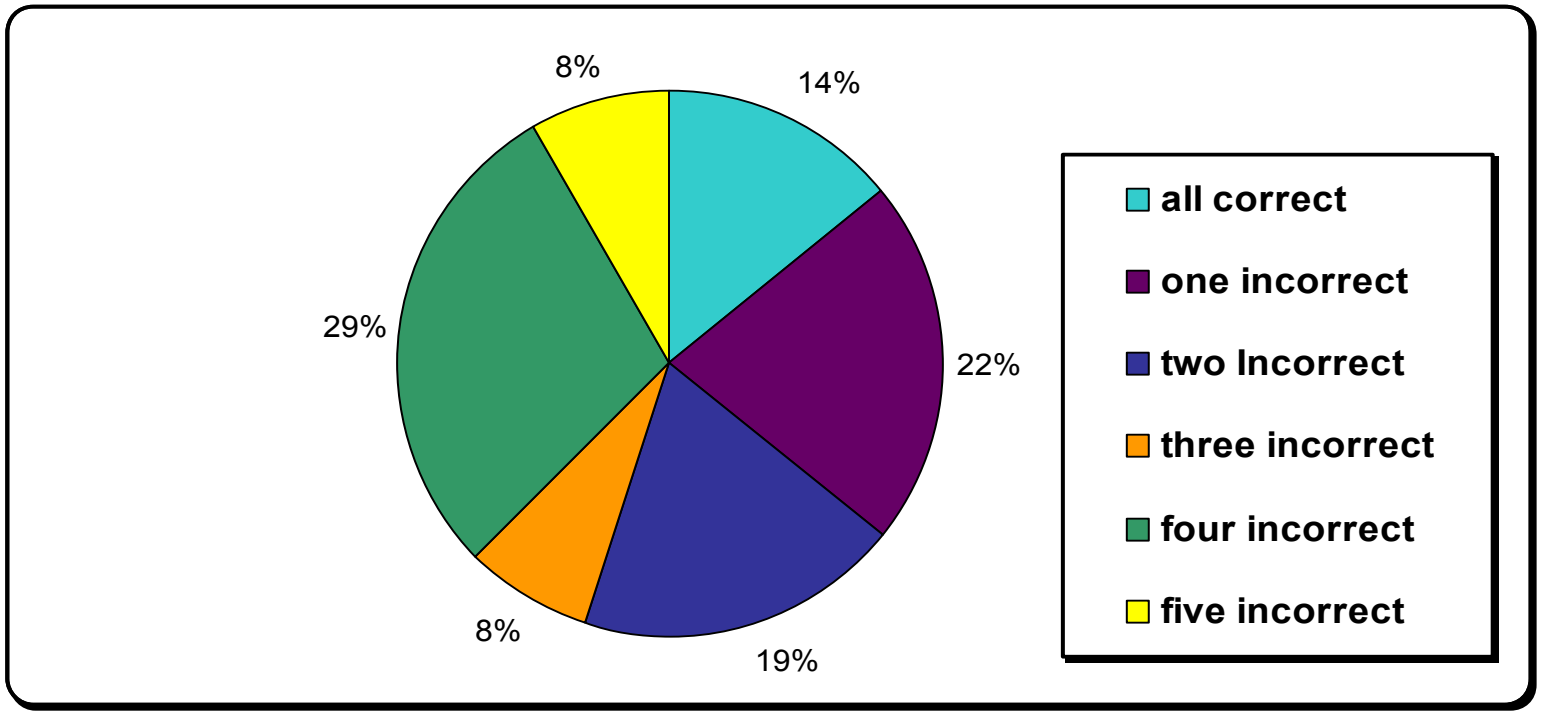
IV. “Comment on different aspects of estimated GFR “

15. For the two different formulas to estimate the GFR from serum creatinine the following parameters are required

	Cockcroft-Gault formula	abbreviated MDRD formula	Correct answers
serum creatinine	X	X	63.4 %
serum urea			67.3 %
age	X	X	58.6 %
sex	X	X	53.8 %
body weight	X		62.4 %
ethnicity		X	52.0%

IV. "Comment on different aspects of estimated GFR "

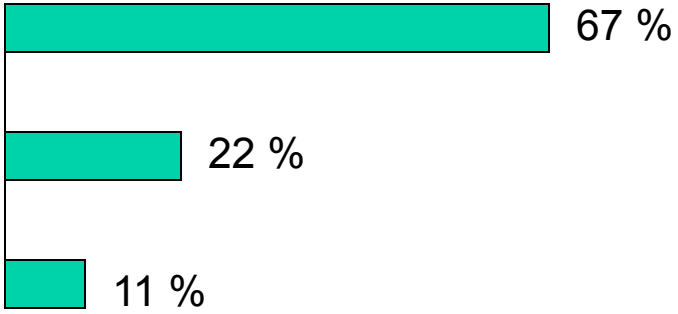
15. For the two different formulas to estimate the GFR from serum creatinine the following parameters are required



IV. “Comment on different aspects of estimated GFR “

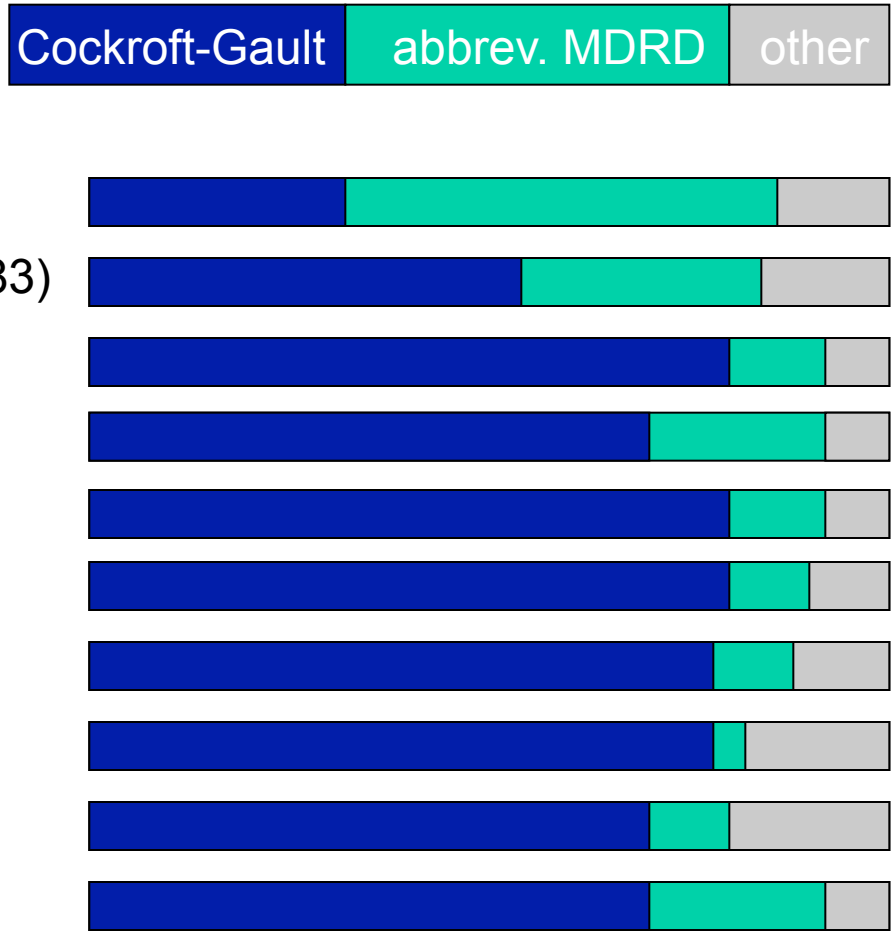
16. I personally prefer to use the following formula for estimation of GFR

- Cockroft-Gault
- abbreviated MDRD
- other



IV. "Comment on different aspects of estimated GFR "

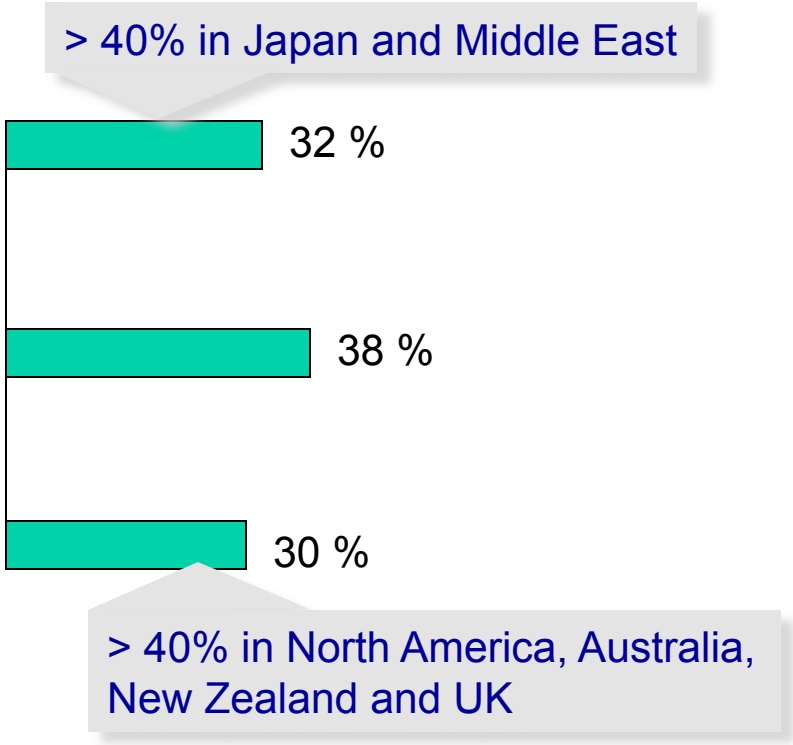
16. I personally prefer to use the following formula for estimation of GFR



IV. "Comment on different aspects of estimated GFR "

17. In my view the GFR estimated from serum creatinine in daily practice is

- of less value than the measurement of creatinine clearance
- of similar value to a measurement of creatinine clearance
- better than the measurement of creatinine clearance

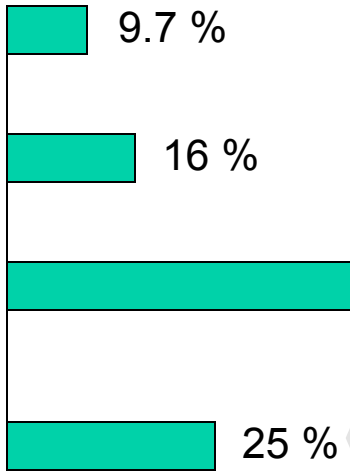


→ *mixed opinions*

IV. "Comment on different aspects of estimated GFR "

18. The routine reporting of estimated GFR from serum creatinine by clinical chemistry laboratories

- is unnecessary
- is desirable, but not feasible
- is desirable and feasible
- is already implemented in my professional environment



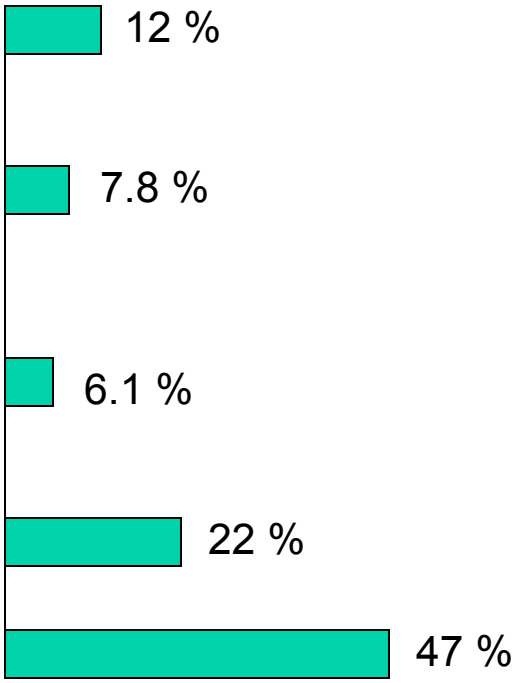
40% in W Europe (except UK)
< 10% in Australia, New Zealand, Japan

- Cockroft-Gault **21.6** %
- abbreviated MDRD **6.8** %
- other **2.9** %

IV. "Comment on different aspects of estimated GFR "

19. If in your view the routine reporting of estimated GFR from serum creatinine is desirable, what do you consider to be the main problem for implementation

- technical barriers
- lack of co-operation with clinical chemist
- resistance of physicians to use a "new" parameter
- all of the above
- I would not expect major difficulties

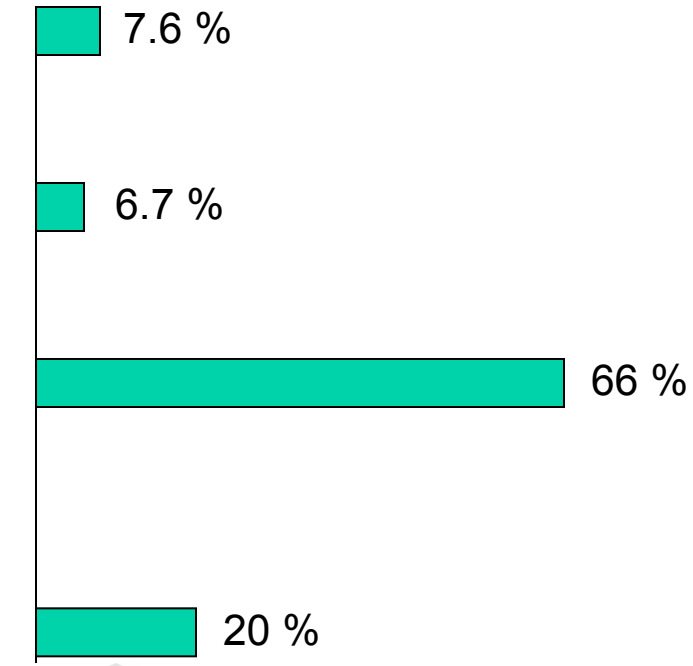


→ *50% envisage different hurdles*

IV. "Comment on different aspects of estimated GFR "

20. If routine reporting of estimated GFR would be implemented, what consequences would you predict for nephrology practice

- no significant consequences
- fewer referrals, because non-nephrologists then obtain information on GFR
- more referrals and I would consider this as an improvement
- more referrals, but I would consider this as a problem, because nephrology resources would not be sufficient to deal with the increased workload

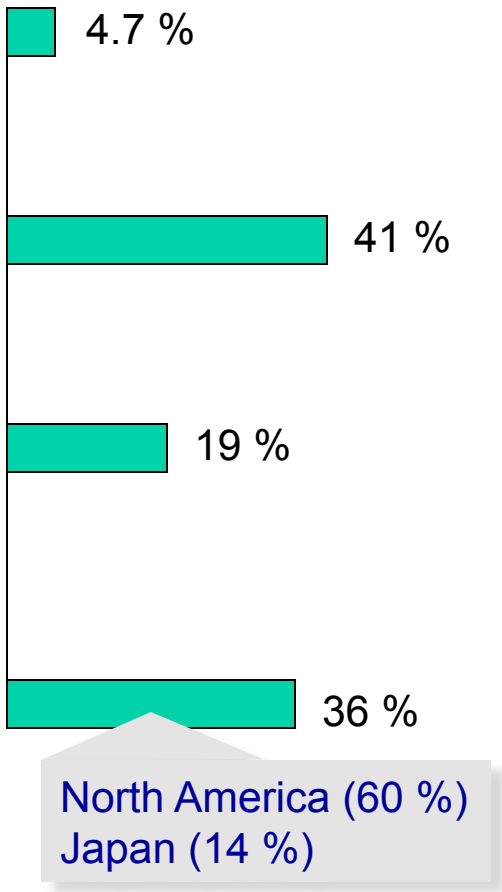


Australia, New Zealand (48%)
UK (59%)

V. "Comment on measurement off proteinuria"

21. The measurement of protein related to creatinine in a spot urine sample is

- a very inaccurate method, that does not reveal comparable results with 24 hour urine collection
- a useful screening test for proteinuria, which however requires confirmation by 24 hour urine collection
- a method which is sufficient to identify individuals with pathological proteinuria but is not sufficient for monitoring the course of proteinuria
- a method which makes 24 hour urine collection unnecessary in most patients

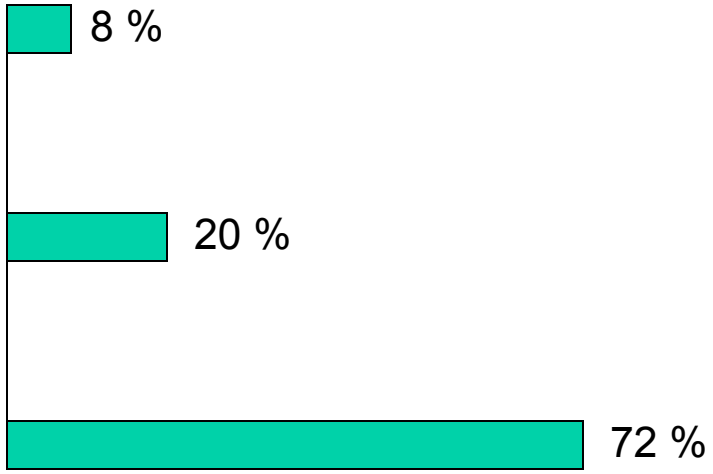


→ *60% believe it is not as good as timed collections*

VI. "Comment on the K-DOQI classification system of the stages of kidney disease "

22. Consider the definition and classification of stages of kidney disease, as developed by the National Kidney Foundation in the USA

- in my opinion this system is not helpful
- in my opinion this system could be helpful, but I would prefer that it is modified
- in my opinion this system can be used as it is and should be introduced and widely used as soon as possible



→*high agreement, despite concerns about different components that were expressed in previous answers*

VI. "Comment on the K-DOQI classification system of the stages of kidney disease "

23. Please indicate the limitations of the system and how you would suggest to modify it

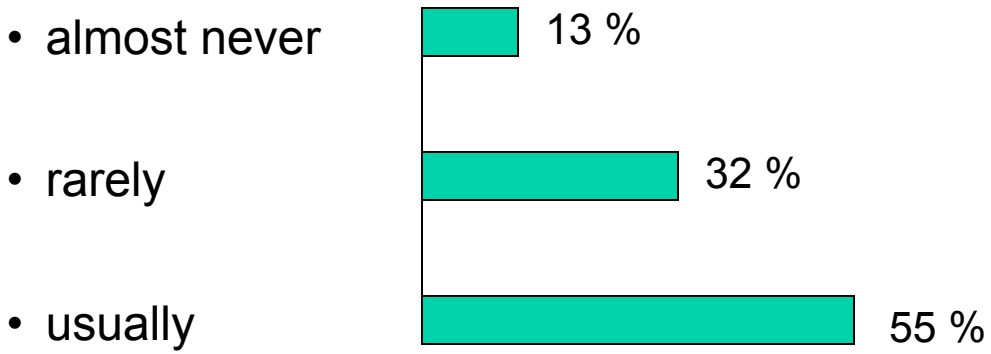
Very helpful comments - four main categories:

1. Stages unclear/need to be altered
2. Something is missing from system
3. Problem with definitions
4. Problem with the way things are measured or done in reality
5. Problem with classification systems in general

→ Details to be discussed in workgroup sessions

VI. "Comment on the K-DOQI classification system of the stages of kidney disease "

24. Is this system currently being used in your professional environment ?



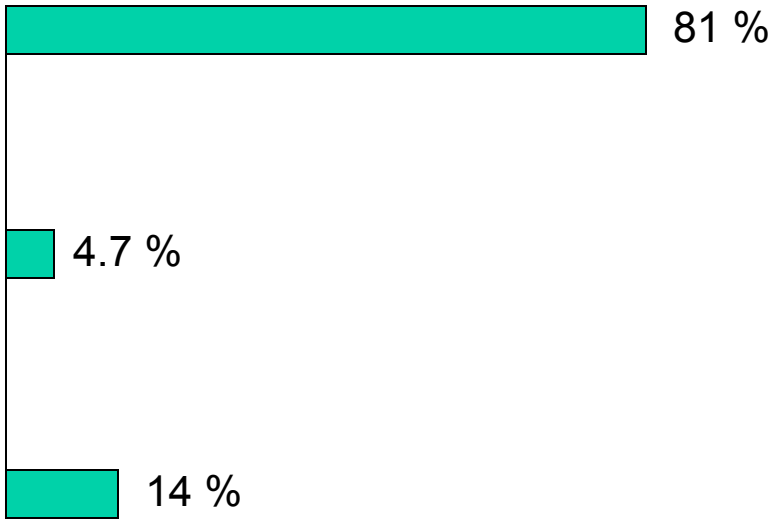
→ *the glass is more half full than half empty*

VI. "Comment on the K-DOQI classification system of the stages of kidney disease "

25. Please indicate your view about the above classification system in conjunction with routine reporting of calculated GFR.

The automatic reporting of GFR and the classification system

- would be helpful in identifying individuals with kidney function abnormalities
- would be misleading and lead to un-necessary referrals to nephrologists
- is not sufficiently validated to warrant its use in general clinical practice



Summary and conclusions

Definition and Classification of Kidney Disease

- KDOQI system rather frequently used already (24);
- vast majority believes that it helps in identifying individuals with kidney function abnormalities (25), but
- almost 30% find it not useful or would prefer modification (22);
- many request additional information (aetiology, renal and CV prognosis) (6,7);
- inconsistent terminology (11)

Assessment of GFR

- eGFR already frequently used (8), but
- majority feel that it should not be used alone for detection and follow-up (12, 13);
- one third consider it of less value than creatinine clearance (17);
- routine reporting implemented in 25%, but almost 50% envisage problems;
- general believe that routine reporting leads to more referrals (25);
- preference for Cockcroft-Gault as compared to MDRD (16);
- uncertainity about methodology (9, 15)

Assessment of proteinuria

- search for microalbuminuria possibly neglected (10);
- total protein assays more frequently used than albumin assays (10);
- spot samples less frequently used than timed collections (10), and only one third believe that they make timed collections unnecessary (21)

The work group members express their sincere thanks to those colleagues in all parts of the world who took their time to support the KDIGO process by replying to the questionnaire.